

A new genus of West African earthworm with notes on the identity of *Iridodrilus* Beddard, 1897 (Eudrilidae : Oligochaeta)

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In 1897 Beddard described an earthworm found in soil received from Lagos which because it had fewer intestinal gizzards, three, compared with species of his monotypic genera *Hyperiodrilus* and *Heliiodrilus* from the same region each with six intestinal gizzards, he recognized as a new genus and species, *Iridodrilus roseus*. His action was acceptable since although few earthworms with intestinal gizzards were known at that time, among groups with oesophageal gizzards, the number and location were considered to be of primary taxonomic significance. Consequently in the Eudrilinae (Michaelsen, 1900), species with six intestinal gizzards came to be assigned to *Hyperiodrilus*, with *Heliiodrilus* being reduced to a synonym by page priority, while species with three intestinal gizzards were accommodated by *Iridodrilus*, for example the otherwise dissimilar species from the Cameroons, *I. preussi* Michaelsen, 1903.

This simplistic solution obscured the true affinities of some of the included species and many years elapsed before further material was collected that led to a morphological re-examination and appraisal of affinities of the species. Evidence that the numbers of intestinal gizzards could vary within a genus came with the description of new species of *Legonea* by Sims (1964) and Clausen (1967), and of *Hyperiodrilus* by Sims (1965) and Clausen (1967). Next it was shown that the possession of the same number of intestinal gizzards did not necessarily constitute grounds for making two species congeneric. Series from the vicinity of Ibadan possessed six intestinal gizzards but were found to have a basically paired spermathecal system below, or alongside, the gut like that described in *Heliiodrilus lagosensis* and unlike *Hyperiodrilus africanus* that has perioesophageal ducts uniting dorsally in a single supra-intestinal receptaculum seminis; thus *Heliiodrilus* and *Hyperiodrilus* were separated (Sims, 1977). In my opinion a similar situation persists in the genus *Iridodrilus* caused by overemphasis of the criterion of the presence of three intestinal gizzards for the inclusion of a species in the genus. This practice has resulted in dissimilar taxa, the poorly described *roseus* Beddard and the well-defined *preussi* Michaelsen being placed together while more recently the situation has been further confused when a new species *I. vomiensis* was described together with a close ally *I. tonyii* that has four intestinal gizzards (Segun, 1977a). Accordingly to obtain more detailed information on the morphology of the type species of the genus than originally provided by Beddard, the two syntypes of *I. roseus* (BM(NH) 1904.10.5.962) were re-examined.

Part I

Iridodrilus roseus Beddard, 1897

Iridodrilus roseus Beddard, 1897. Proc. zool. Soc. Lond. 1897, p. 346.

DESCRIPTION. *External characters.* Length 58, 76 mm, diameter 3 mm. Segments 94, 143; tending towards a biannulate condition. Dorsal pores absent. Clitellum almost annular but with a pale midventral stripe where the ventral edges fail to meet, thus strictly the clitellum should be regarded as being saddle-shaped. Male pore single, midventral in furrow 17/18, seen as a boss-like porophore with a longitudinal slit. Penial setae absent. Female pores paired ventrally near the equator of segment *xiv*, located setal distance *2ab* within setal lines *aa*. Spermathecal pore single, midventral in furrow 12/13, carried on a low but broad porophore extending $\frac{1}{2}xii$ — $\frac{1}{2}xiii$. Nephridiopores paired between setal lines *cd*.

Setae eudriline, $ab > cd$; postclitellar setal formula $aa:ab:bc:cd=9:6:5:1$ where dd is equal to half the body circumference.

Internal characters. Septa 4/5–12/13 thickened. Oesophageal gizzard(s) absent; three intestinal gizzards present *xviii*, *xix*, *xx*. Calciferous glands paired *xiii*, suboesophageal pouches well-developed *x* and *xi* (i.e. absent from *ix*). Holandric, each testis is enclosed in a testis sac formed from the ental end of the vas deferens and continuous with its seminal vesicle; the seminal vesicles appear to be convoluted but on unfolding are found to be simply digitiform. Euprostates are long and extend for several segments behind *xviii*. Spermathecal atrium muscular extending from the hind region of *xii* nearly to $\frac{1}{2}xiv$, the hinder region opens ventrally into a membranous subintestinal receptaculum seminis that posteriorly tapers to septum 16/17 and anteriorly gives off a pair of massive lateral pouches that flex back alongside the tapering medial portion. Each pouch is constricted posteriorly to form a slender convoluted duct that leads forwards to the fertilization chamber of its side. Ovaries paired on the fertilization chambers from which long oviducts lead into the ventral parietes by the vasa deferentia midsegmentally in *xiv*. A slender membranous duct, ? relict ovarian duct, leads forwards from each ovary to unite below the spermathecal atrium (Fig. 1). Excretory system holonephridial.

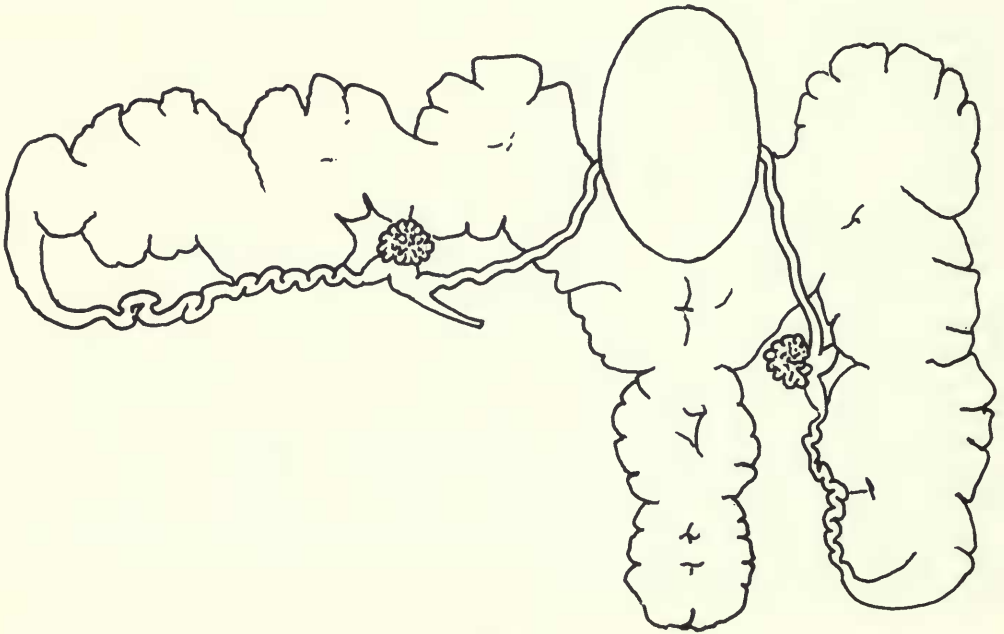


Fig. 1 *Iridodrilus roseus* syntype. Female and spermathecal systems, dorsal view with the left side displaced laterally.

REMARKS. The spermathecal system of *Iridodrilus roseus* is similar to that present in *Heliodrilus lagosensis* Beddard, 1891 (Sims, 1977, Fig. 5). In both the pore is single but the system is basically paired with massive pouches that posteriorly give way to slender ducts communicating with the fertilization chambers. In *H. lagosensis* the medial portion of the receptaculum seminis is wanting also the lateral pouch of one side usually fails to develop but the basic pattern remains sufficiently similar to reveal the close affinity of the two species. It is especially interesting that in *roseus* a membranous coelomic duct joins the two fertilization chambers like the communicating duct in *lagosensis* and could become similarly functional to supply sperm to both fertilization chambers if one of the lateral pouches of *roseus* were to fail to develop. But the greatest similarity between

lagosensis and *roseus* is found in the number and location of the suboesophageal pouches; in the specimens of *lagosensis* examined these pouches are reduced or absent from segment *ix* as in *roseus*. (Beddard, 1891:255, miscounted the segments and reported the presence of 'the first of the two oesophageal pouches' in *xi*, a second in *xii* then a vestigial third in *xiii* before listing the paired calciferous glands in *xiv*). In view of these similarities and the undoubted mutual affinities of the species, I believe that *lagosensis* and *roseus* are congeneric.

Genus *HELIODRILUS* Beddard, 1890

Heliodrillus Beddard, 1890. Zool. Anz. 13, p. 627. Type by monotypy *Heliodrillus lagosensis* Beddard, 1891.

Iridodrillus Beddard, 1897. Proc. zool. Soc. Lond. 1897, p. 346. Type by monotypy *Iridodrillus roseus* Beddard, 1897.

DIAGNOSIS. Eudrilinae with setal distance $ab > cd$. Male pore single 17/18 and several segments anteriorly spermathecal pore single. Penial setae absent. Female pores paired *xiv* or 14/15. Oesophageal gizzard(s) absent, intestinal gizzards present; suboesophageal pouches single *x* and *xi*, calciferous glands paired *xiii*. Spermathecal system paired internally (although one side may fail to develop), paired pouches lead back from the spermathecal pore (or atrium), posteriorly each reduces to a slender duct that passes forwards to the fertilization chamber of its side: a coelomic duct joins the two fertilization chambers.

INCLUDED SPECIES. *lagosensis* Beddard, 1891; *roseus* (Beddard, 1897) **comb. nov.**

DISTRIBUTION. Nigeria (Beddard, 1891: 253 & 1897: 364; Segun 1977a: 588 & 1978: 30; Sims, 1977: 537).

NOTE. The species can be readily distinguished by the presence of several unpaired papillae between *xi* and *xviii* on the ventral surface of *lagosensis* (papillae absent in *roseus*), internally only one pouch usually develops to form a single receptaculum seminis in *lagosensis* (spermathecal elements paired throughout in *roseus*), seminal vesicles digitiform in *roseus* (seminal vesicles unspecialized in *lagosensis*).

Part II

Although the species *roseus* Beddard is now placed in the genus *Heliodrillus*, other species previously associated with it differ in important details and cannot be similarly assigned. These species superficially resemble *roseus* by having only three or four intestinal gizzards but they differ in having paired rolled-tube penial setae and the paired calciferous glands in *xii*. The more anterior location of the calciferous glands seemingly links the species with the *Eudrilus* group of genera and in particular *Nsukkadrillus* which has additionally both rolled-tube penial setae and intestinal gizzards (Segun, 1977b) but they differ in the separation of the female and spermathecal pores. A new genus is accordingly proposed to accommodate the species.

Genus *SEGUNIA* gen. nov.

DIAGNOSIS. Eudrilinae with setal distance $ab > cd$. Male pore single 17/18 and several segments anteriorly spermathecal pore single. Paired rolled-tube penial setae present. Female pore paired laterally on *xiv*. Oesophageal gizzard(s) absent, intestinal gizzards present; suboesophageal pouches single *x* and *xi*, calciferous glands paired *xii*. Spermathecal system paired internally; paired pouches lead back from a medial atrium or receptaculum, posteriorly each reduces to a slender duct that passes forwards to the fertilization chamber of its side; a coelomic duct joins the two fertilization chambers.

TYPE. *Iridodrillus preussi* Michaelsen, 1902.

INCLUDED SPECIES. *preussi* (Michaelsen, 1902) **comb. nov.**; *tonyii* (Segun, 1977a) **comb. nov.**; *vomiensis* (Segun, 1977 a) **comb. nov.**

DISTRIBUTION. Cameroons (Michaelsen, 1902); Nigeria (Segun, 1977a & b; 1980).

NOTE. The species may be distinguished externally by differences in their papillae patterns (Segun, 1977a) and internally by the number and location of the intestinal gizzards: *preussi* xviii, xix, xx; *vomiensis* xix, xx, xxi; *tonyii* xx, xxi, xxii, xxiii.

The new genus is named in honour of Dr A. O. Segun, Museum of Natural History, University of Ife, Ile-Ife, Nigeria.

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